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Changes in the World Copper Economy

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Compared with its total copper consumption of about 668,000 tons, the Federal Republic's own copper mining output is negligible. The German Copper Industry for its production of some 382,000 tons of finished copper therefore depends entirely on raw material imports¹. The most important suppliers have in recent years been Zambia, South Africa and Chile — countries which, it must be added, are already themselves exporters of finished and semi-finished copper goods. Smaller quantities of raw material reach the Federal Republic of Germany from Peru, Norway, Cyprus and Turkey.

The Mining Countries' Point of View

The German Copper Industry is finding it however more and more difficult to obtain the necessary raw materials because the traditional copper mining countries are building up their own refineries and plants for the manufacture of semi-finished products — in many cases without regard to economic criteria; disadvantages due to location are being compensated for by protectionist measures.

Chile is a case in point: In spite of the fact that its production structure is already extremely unbalanced², Chile is aiming to increase its mining output by the early seventies from the present level of about 700,000 tons to 1.2 mn tons and at the same time double its own refining capacity from 335,000 tons to 700,000 tons. For the more

distant future, a considerable expansion of the output of semi-finished goods is also planned.

Such a strategy would appear to be in accord with the basic principles of the development theory which demand that the mining countries should as far as possible undertake their own processing. But in applying these general maxims to the raw material copper, one finds that, at least in the case of Chile, there are serious objections to such a policy. An international comparison shows that under present conditions the mining and refining of copper yields low gross profits. Such activities are therefore economically worthwhile only if labour productivity is at a high level and if the cost of finance and the sums set aside for depreciation in this heavily capitalised production process do not represent too large a share of the total costs.

Inefficient Use of Labour

Low productivity of the work force can very quickly lead to considerable losses. It is of course true that the argument of insufficient productivity of the workers can in many cases be refuted by pointing to a long-term development. But it was precisely the case of Chile which showed that productivity was impaired not so much by insufficient training³—a shortcoming that might possibly be overcome—as by prevailing, and far more rigid sociological conditions. As Lauterbach has shown, important positions are frequently filled, not by qualified staff, but by—possibly unsuitable—members of influential families or by adherents of parties that happen to be in power at the time of the appointment⁴. Another factor in Chile is a social legislation which for example by providing

* For a comprehensive study see: H. Jürgensen / M. Schulz-Trieglaff, "Development Perspectives of the World Copper Economy — Alternatives and their Consequences for the Federal Republic of Germany." Due to be published at the end of 1969 as Number 11 of the *Weltwirtschaftlichen Studien des Instituts für Europäische Wirtschaftspolitik* of Hamburg University. Publishers: Vandenhoeck and Rupprecht, Göttingen.

¹ In 1967, total consumption was covered by 274,300 tons of imported finished copper, 152,900 tons of copper scrap and an internal production of 220,900 tons net. See: *Metallstatistik 1958—1967* by Metallgesellschaft A. G., 55 Jg. Frankfurt am Main, 1968, page 151.

² Thus at present (1967) copper already accounted for 63.7 p.c. of Chile's total exports.

³ In principle, Chile should have sufficient qualified workers to cover the needs of its own copper industry.

⁴ See also: A. Lauterbach, "Enterprise in Latin America". Ithaca, New York 1966, from page 5. Incidentally, Chilean sources roughly confirm Lauterbach's findings.

protection against dismissal and high compensation payments considerably impairs the mobility of labour. Finally, innumerable incidents in the Chilean Copper Industry have shown that the trade unions, instead of pursuing a meaningful policy for better wages and working conditions, see themselves primarily in the role of political organisations.

All these factors together lead to a relatively inefficient use of the labour factor in the production process, and the effect on labour costs of this inefficiency cannot be compensated for by the prevailing low level of wages.

Distant Markets

Obviously, the geographic situation of the copper-mining countries is also an argument against refining the copper where it is mined. Only state intervention in the form of prohibitive export duties could more or less artificially correct this situation, unless transport costs would decline parallel to the processing stage and thus produce the necessary compensatory effect. A look at the freight-rate from Chile to Europe shows however that savings in transport costs can be made only if blister copper is shipped instead of concentrate. Finished copper on the other hand costs more to ship than blister copper because it is more difficult to transport, and for semi-finished copper transport charges are again higher than for finished copper. Shipping costs therefore accentuate the natural handicaps inherent in the siting of copper refineries and plants for the production of semi-finished copper products in countries where copper is mined.

Finally, there is yet another factor which places the mining countries at a disadvantage. In view of the slow growth of South-American demand, Chile is obliged to sell most of its finished and semi-finished copper in the markets of Europe and North America. Experience has shown however that the trade in copper and semi-finished copper products needs to be highly flexible in order to be able to adjust itself to the very discriminating and frequently changing demand. Naturally, long transport routes are anything but helpful in this regard.

Small Effect on Employment

Now, the effect of a purely Chilean Copper Industry on the country's economic growth is not necessarily measurable in terms of its profitability. It would on the contrary be conceivable that considerations concerning long-term growth effects would have to take precedence over mere profitability. Let us therefore examine in how far this would be justified in the case of Chile.

If one looks first of all at the effects on employment of an extension of Chile's Copper Industry, one finds that these effects must be small where one has to do with such a highly capitalised

production process as the refining and further processing of copper. Even in such conditions as prevail in Chile, a copper refinery with an annual capacity of roughly 100,000 tons of finished copper would require at most 2,000 factory and office workers, whereas the capital needed for such an undertaking would amount to DM 100 mn or on average DM 50,000 for each job, which is considerably more than is required in other processing sectors. Similarly unfavourable is the relation between the two production factors labour and capital in factories producing semi-finished goods.

Growing Rigidity of the Foreign Trade Structure

Another argument against a general extension of the copper sector of the Chilean economy is still more important than the fact that the effect on the general employment level would hardly be impressive. If these Chilean plans were to be realised, they would of necessity make the country's economy even more dependent on price fluctuations on the world copper market. Past experience has shown that these price fluctuations, which have at times been considerable, have aggravated Chile's balance-of-payments difficulties. Expanding its own copper industry further would make the country's export structure still more unbalanced. At the same time, the increased demand for equipment goods would lessen its flexibility as far as imports are concerned. Moreover, as the balancing of the Chilean budget depends to a decisive extent on the trend of the world copper market⁵, fluctuations in the price of the metal would be a further potential source of trouble. In addition, unprofitable refineries and possibly also unprofitable factories for semi-finished copper goods, instead of bringing in more revenue, would in the first instance oblige the government to pay subsidies to cover these losses.

Effects on the Federal Republic of Germany

Given that the net value added by the refining and semi-finished production stages is unlikely in the prevailing circumstances to have any drastic effect on the growth rate of the national product, the planned expansion of the Chilean copper sector would seem to be a most unsuitable development strategy inasmuch as it will not give the necessary "big push" to the economy nor reduce the existing imbalance in the country's production structure.

For the German Copper Industry such a strategy means the loss of its traditional raw material sources because the Chilean government can realise its plans—which make no economic sense—only by way of introducing protectionist practices such as prohibitive export duties. The German copper works will thus be obliged to seek new raw material deposits in competition with other

⁵ The Chilean budget estimates for instance assume a certain copper price which is used as a basis.

copper consumer countries which are likewise not prepared to give up their own manufacture of finished copper and semi-finished copper products.

The international raw material business, however, has for some years now required financial aid to enter into long-term contracts for the expansion of the existing mines or the opening up of new ones. In the case of contracts running for a minimum period of ten years, an annual output per ton of copper in its crude state requires at present about \$ 1,000 to finance. Copper mines and refineries are in no position to raise such large amounts by themselves because at this stage of production the net value added is too small. In many important consumer countries there exist therefore comprehensive state schemes to help their copper industries.

The Example of Japan

Japan—to quote only one example⁶—intends to increase its copper production by 1975 from the present level of 616,000 tons to about 1.017 mn tons, and this in spite of present development trends in the copper mining countries. In view of the fact, however, that Japan's own mining output can be raised in the same period to no more than 175,000 tons, the Japanese Copper Industry is almost completely dependent on imports of the crude metal. The Japanese Copper Industry is being helped in many different ways to enable it to finance mining ventures so that it can broaden its raw material basis.

The most important measure is without a doubt a system of protective customs duties which turns to good account a characteristic feature of the copper trade. As a close connexion exists between internal and world market prices, it is possible artificially to increase the prices for imported copper by imposing import duties and at the same time to raise the sales price of producers at home to beyond the world level. It is precisely at this point that the Japanese system operates: raw materials are allowed in duty-free, but finished copper is heavily taxed which enables the home producers to make considerable additional profits.

The possible danger of price cutting in the Japanese home market has been avoided by the creation of a cartel of the large copper concerns which fixes the prices for finished copper. This cartel, which is safe from foreign competition, has been able to achieve two things: Firstly, by giving the Japanese copper concerns the chance of considerably increasing their profits it has extended their scope for financing their operations, and, secondly, it has given them an added competitive advantage on the international markets for the

raw material. Recently, the copper-mining countries have called for guaranteed minimum prices for their primary copper, and it is immediately apparent why only the Japanese producers are in a position to agree to such a request, for they are able to control the internal price for finished copper. Compared with the cartel and the system of protective duties, the measures designed to give direct aid to the copper industry are relatively unimportant. They concern mainly the granting of credits on favourable terms by various state institutions and a rather generous system of state guarantees.

Germans Handicapped

As of now, the Federal Republic of Germany in common with several other West European countries has no machinery to support its Copper Industry, with the result that industry is faced with a twofold problem: On the one hand, it loses more and more of its traditional raw material sources, on the other, it is decisively handicapped in the world-wide competition for new copper deposits in spite of the fact that it still has a higher productivity of labour. This disadvantage is due to the fact that German firms more often than not lack the funds they require to conclude long-term raw-material agreements. In the long run, they will therefore lose their traditional sources of supply which they will be unable to replace by adequate new ones.

The result of all this is almost certain to be that the German Copper Industry, efficient though it is by international standards, will be unable to obtain the raw material it needs, simply because it finds itself outbid when it comes to granting favourable conditions and financial help for the opening up of new mines. In the long run, the possibility of a structural crisis in the German Copper Industry cannot be excluded — a danger which would not be without appreciable effects on related production sectors, for a contraction of the German copper sector would have unfavourable consequences for parallel and later stages of production. The effects of a shrinking German Copper Industry on the labour market are not the only unfavourable consequences.

If copper production at home were to cease, not only the users of finished copper, that is mainly the producers of semi-finished goods, but also their customers, the investment goods industry and the electrical engineering sector, would find themselves faced with the problem of obtaining the necessary supplies elsewhere. It must however be borne in mind that in the final analysis these supply difficulties are due to the development policies of the mining countries. The abandonment of copper production at home would simply magnify the basic problem because at present only part of the home demand is satisfied internally.

⁶ A comprehensive programme for the promotion of the copper industry exists for instance also in the USA. Canada grants tax privileges, so do Australia and Rhodesia, and Spain has a protectionist system similar to that of Japan.

The endeavours of the mining countries to become themselves more industrialised and the consequent diversion of trade could thus have the following effects:

☐ During the first phase, the German copper works would lose their raw material, while the producers of semi-finished goods will become entirely dependent on imported finished copper. This dependence would not matter as long as the manufacturers of semi-finished goods could get their copper on approximately as favourable terms as they used to obtain them from their suppliers at home. But it has already been made clear that this is unlikely to be the case. The lower productivity of the labour force in the mining countries, more frequent strikes (declarations of "force majeure") as well as greater distances between producers and consumers should in any event result in higher costs for the German manufacturers of semi-finished products.

☐ During the second phase, the manufacturers of semi-finished goods would have to reckon with the possibility that they would no longer be able to obtain their copper supplies from the traditional mining countries because these intend to produce their own semi-finished goods. Once the factories turning out semi-finished goods have ceased production, the industry producing investment goods and the electrical engineering sector would be faced with the same supply problem as that which will shortly confront the producers of semi-finished goods.

Economic policy cannot remain indifferent to these developments which threaten to drag an entire industry into a structural crisis – an industry which as far as productivity is concerned occupies the top position in the international scale of production. Solely responsible for the threatened crisis is

the increasing protectionism in the traditional copper mining and consumer countries, and not shifts in the supply and demand situation – shifts such as would naturally arise from normal economic growth.

Necessary Adjustments

The first thing to do to enable the German Copper Industry to adjust to the new situation is to increase funds for financing purposes because this is the only way of solving the raw material problem. This requires:

- ☐ a reform of the practice to promote direct investments abroad through state guarantees,
- ☐ an easing of the tax burden (permission to set working losses sustained abroad against profits made at home),
- ☐ help with prospecting operations.

The German Copper Industry for its part can help by trying to get copper industries in other countries to cooperate in this matter, preferably on a European basis. Finally, the industry's own structure ought to be improved; in the semi-finished goods sector, firms ought to be brought up to optimum size, and the production of semi-finished goods ought to be linked with the copper works.

For the mining countries an expansion in the German copper production such as might be achieved in the above mentioned manner would naturally be a decisive setback in their endeavours to extend their activities to the processing of raw materials. But the way they have chosen is economically unsound, and it would therefore be wise to examine whether it would not be advantageous for both sides to expand copper production in the consumer countries in partnership with each other.

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